improvement of the metal, i.e., deoxidation. But the removal of the slag, .especially with fixed open-hearth furnaces, cost much trouble and, above all, time. Latterly, it has been recognised that a slag low in oxides is unharmf ul. Therefore, Riich are now aimed at and are left in the furnace until the end of the process. In this case deoxidation can be accomplished in a few minutes by means of an addition of about 0*75 per cent, of 80 per cent, ferro-manganese, after which the charge is ready for tapping. All reactions proceed practically spontaneously, also the regulation of the heat, and the entire process requires only little superintendence and aid. This method ol' Htoel-melting is, therefore, very easy to carry out, and is in all respects convenient.

It has been already mentioned on pp. 188 — 191 that in most furnaces, in the pig and scrap process, approximately 2'5 to 3 per cent, of oxygen (taken on the weight of the xnetal) is taken up by the bath owing to furnace action, whereby about 1/2 per cent. 0, 0*H per cent. Si, 0"6 per cent. Mn, and 0*2 per cent. P are removed from the charge, and, in addition, about 1 per cent, iron is burnt. The oxidation of all these substances influences the quantity of heat to be delivered by the furnace, in such wise that heat gains per kilogramme steel are given rise to as follows :—

Krom formula. (02) 1*2 per cent. 0 xH~~~l(>*8 calories. («1)(HJ „ ((JO) 0-2 „ P

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Total heat gains 29*2 calories less loss as under ; from formula, (58) (Ki percent. Six I5=_lj^___i>_

Or net heat gain 24*7 calorics per kg. steel.

That is to say, the furnace work is diminished by the above amount, whereby the heat requirement for the production of 1 kilogramme steel is placed at about 825 calories. This heat gain is, however, counteracted if the charge is admixed with 0'5 per cent. BiO& since 1 per cent, SiOa, according to formula (f>9), involves a heat absorption of 48 calories.

The elimination of the reducing agents gives rise to a loss of weight or loss of charge of 1*2 per cent. C, 0*8 per cent. Si, 0-2 per cent. P, 0*(5 per cent. Mn, I'OO per cent. Pe, or a total of 8'8 per cent., so that an output of 96*7 per cent, must